Math 2150 - Homework # 12

Power series solutions of ODEs

1. Find the first <u>five</u> non-zero terms for a power series solution to

$$y'' - (x+1)y' + x^2 y = 0, \quad y'(0) = 1 \quad y(0) = 1$$

   For what x does the power series converge?

2. Find the first <u>four</u> non-zero terms for a power series solution to

$$y'' + \frac{x}{1-x^2}y' - \frac{1}{1-x^2}y = 0, \quad y'(0) = 1 \quad y(0) = 1$$

   For what x does the power series converge?

3. Find the first <u>five</u> non-zero terms for a power series solution to

$$xy'' + x^2 y' - 2y = 0, \quad y'(1) = 1 \quad y(1) = 1$$

   For what x does the power series converge?

4. Find the first <u>four</u> non-zero terms for a power series solution to

$$y'' + \sin(x)y' + e^x y = 0, \quad y'(0) = 1 \quad y(0) = 1$$

   For what x does the power series converge?